Temperature Remote I/O (TRIO) Chip
&
TRIO Assembly Slice (TAS)

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- **TRIO** (Temperature Remote Input Output)
  - A Very Low Power Multi-input Rad Hard A-D
- **TAS** (Temperature Remote Assembly Slice)
  - Contains 6 TRIO chips + Rad Hard Voltage References
    - 2 sets of 3 units on separate power & ground planes
    - Design robust to 1 MRad

Contract Implementation

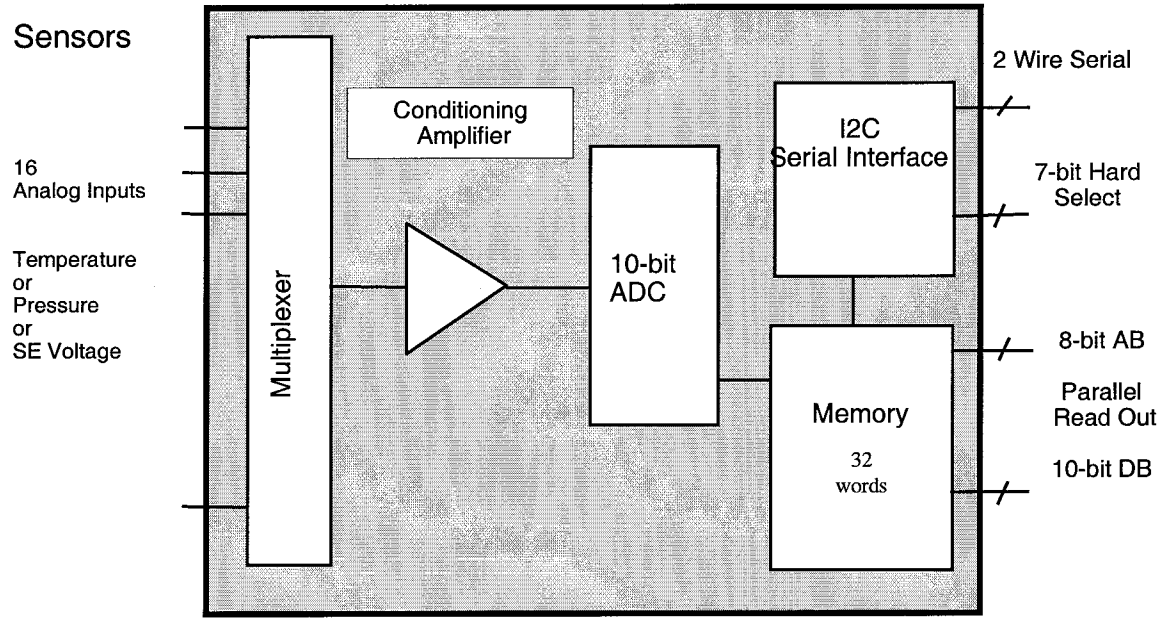
- Both the TRIO (Chip) and the TAS (Slice) are being developed & acquired under contract from Applied Physics Laboratory Johns Hopkins University, Laurel, Maryland
- The TRIO chip is an upgrade to the "TRIO-A" chip designed by APL and being used in several APL-run Space Missions
  - The upgrades JPL requested are: lower power, Fail Safe I^2C interface, Higher accuracy (10 bits vs 8), Additional MUX inputs + external mux controls

TRIO Specifications

Temperature Remote Input Output

- Self-contained, High Accuracy A-D
- 10 bit accuracy, 150 kHz conversion clock
- 10 mW worst case, >1 MRad
- I^2C Command, Control, Data
  - Fail Safe output
- 16 Multiplexed input channels, control to 32
  - Voltage mode or Temperature (eg PRT)
- Compatible with Internal, On-Board, or Off-Board Vref

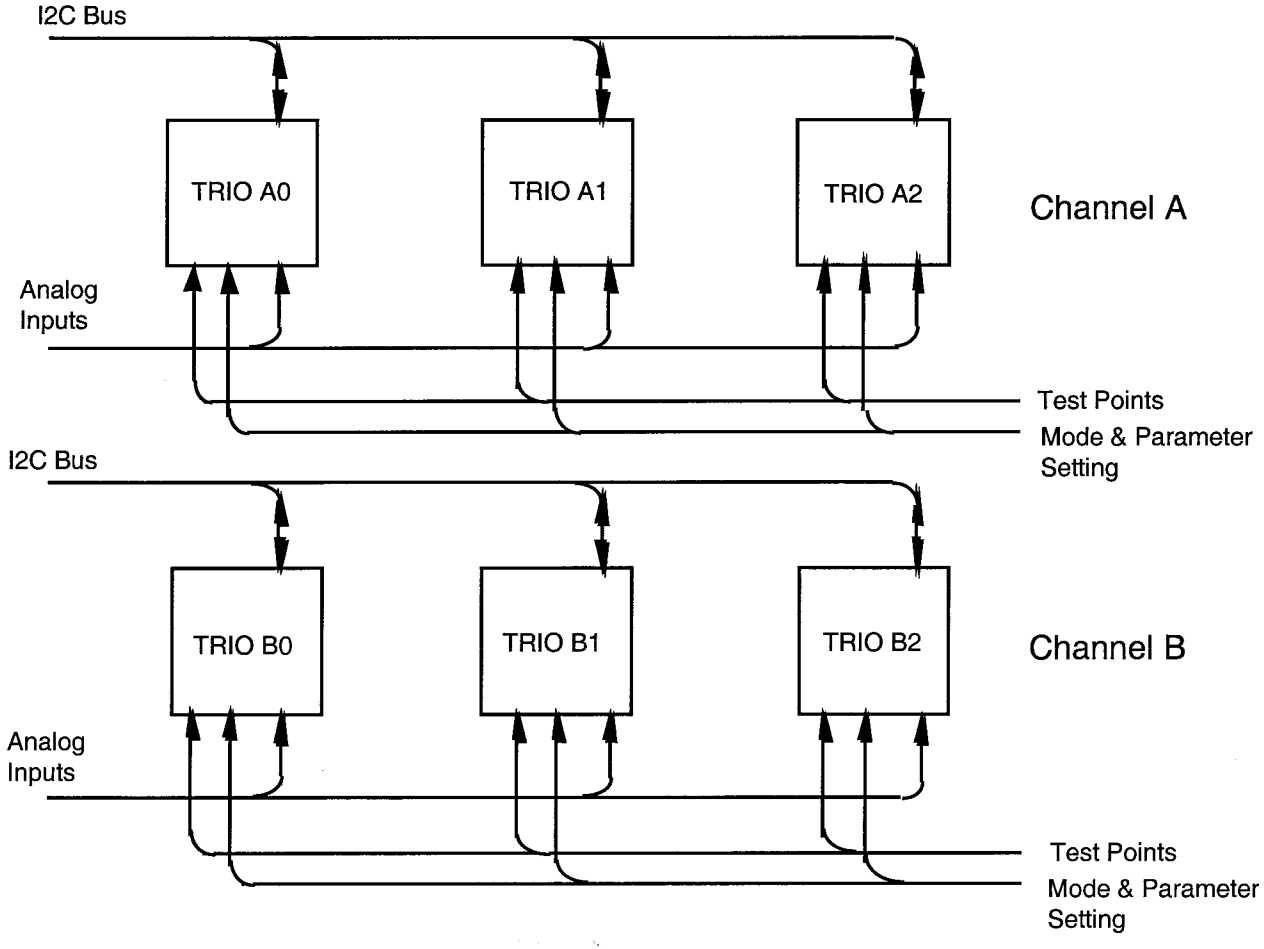
TRIO (chip) Block Diagram



TAS Specifications

- 6 TRIO chips
  - 2 banks of 3 each on separate I^2C buses
  - Each bank contains own Vref & Vcal source
  - Each bank Independent Power & Ground Planes
  - 3U cPCI form factor
  - Configurable via BackPlane connectors
  - 3.3V, < 600 g, 100 mW (all circuits operating)

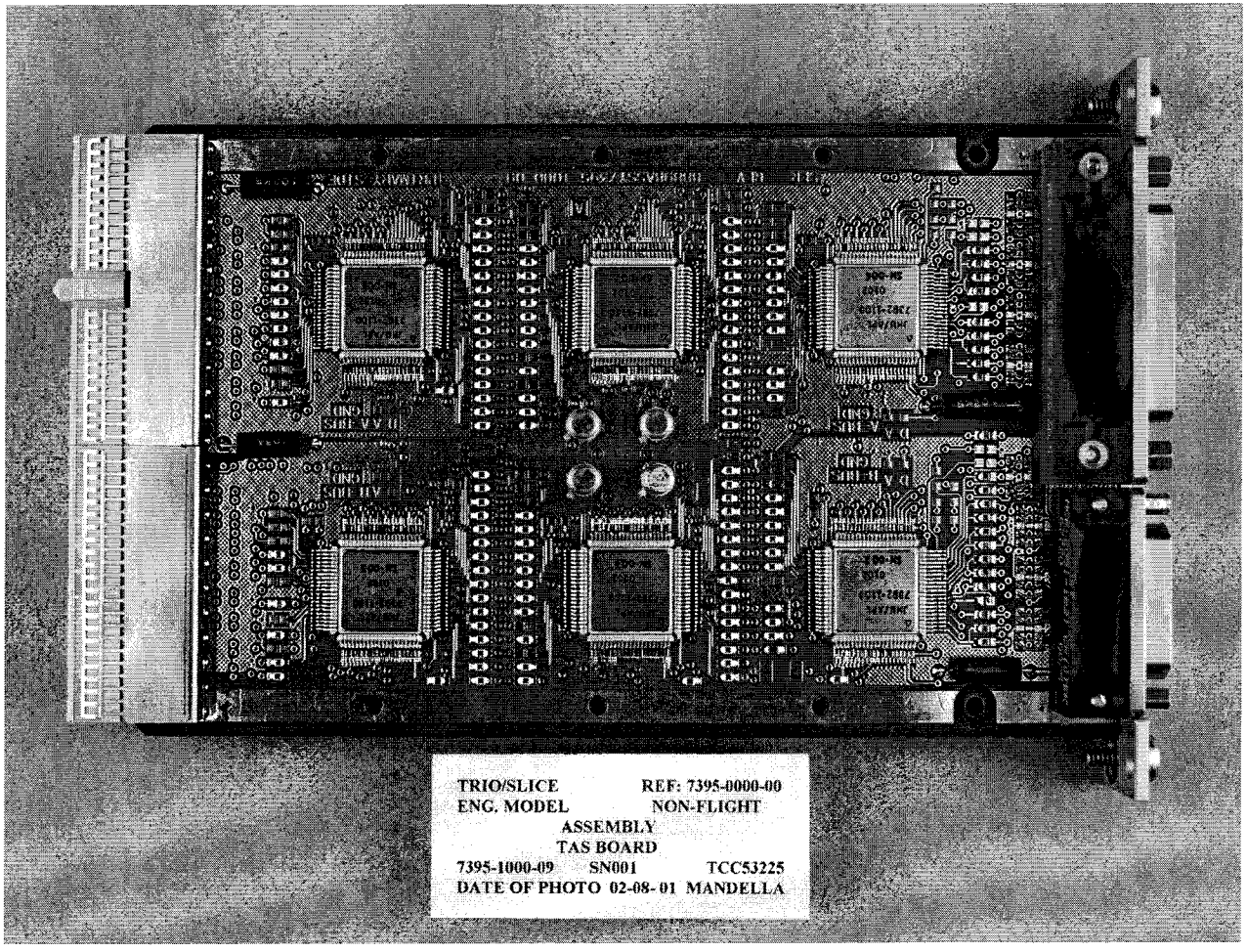
TRIO Assembly Slice Block Diagram



TAS Configurability (each TRIO)

Mode	Temperature or Voltage	Full Scale or Windowed
Voltage Reference	Internal, On Board, Off Board	AutoZero on/off
Input Select	Autoscan, Fixed, or Commanded	
I2C Command/Data Bus	7 bit Addressing	Fail Silent Mute Time adjust + on/off
Conversion Start	Command or Auto	Conversion-in-Process status

TRIO Assembly Slice



Status

- TRIO currently in fabrication
  - Honeywell RICMOS IV
  - Second Run Due out August 01
    - Corrected Design Errors and Processing Problems
- TAS CDR conducted
  - Brassboard Unit delivered April 01
    - Utilizing TRIOs from Previous HW Fab Run
  - Qual Test Completion Jan 02
  - EM Board Deliveries Jan 02
  - FM Board Deliveries Feb 02